

Monitoring the Extent and Density of Woody Weeds in Western NSW

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Arid and semi-arid regions of NSW are being seriously degraded, land values are decreasing and production is being reduced by a large increase in the extent and density of woody weeds. These are native shrubs which have encroached formerly open lands of western NSW. The major reasons for this encroachment are a decrease or removal of perennial grasses in competition with the woody weeds and a lack of fires to suppress their establishment. Land productivity and stability are vital to the agricultural industry in western NSW, and landholders must be made aware of the extent of the problem, and its effects on pasture and soil degradation.

A lack of quantitative knowledge on the extent and density of woody weeds has led to the need for an accurate assessment of the problem throughout western NSW. A project was undertaken to quantify these aspects of the problem. The resultant data will provide a valuable historical record and will enable advisory staff to target severely affected areas. It will increase the landholders' awareness of the need to control woody weeds and increase the number of landholders who adopt management strategies as a part of whole farm planning. Control measures available include burning, chemical applications, goat grazing and mechanical methods including blade ploughing and pushing. The use of these measures is dependent on the species to be controlled, environmental conditions, and economic circumstances.

cover, areas of no change and decreased cover).

The image data was then transferred to the GIS where digitised cadastral information, including property boundaries and roads, were overlaid. This information will be integrated into existing advisory programs at the property and paddock level. Printed output of the classified images is available, as is the digital information in the GIS for use

The project has implemented a method developed by McCloy and Hall (1991), to map the distribution and density of woody weeds in western NSW, and to monitor changes using Landsat MSS imagery. This data will be used to develop and maintain a Geographic Information System (GIS), which can improve knowledge of the problem and aid advisory programs, such as identifying properties and paddocks that have conditions of woody weeds requiring the application of various control measures. The advantages of using satellite data are its cost effectiveness, its spatial coverage, availability and repeated coverage, and the ability to apply a variety of processing options for information extraction.

Digital data was purchased from the Australian Centre for Remote Sensing, for each study area (Cobar and Bourke) for the late 1970's to early 1980's and for a recent overpass. Each scene was rectified to the Australian Map Grid, and subsequently classified using the Vector Classifier. The Classifier is a technique used to estimate the proportions of cover types using spectral signatures (nodes) of known cover types. Three nodes were selected from each scene, based on knowledge of the area, collection of field data and use of aerial photographs.

Each date was classified independently and assessed for its accuracy using the ground data. The two dates for each study area were then used to produce an image of the changes in percentage woody canopy cover (increased

by NSW State Government staff with access to GIS in the regional offices.

REFERENCES

- McCloy, K.R. and K.A.Hall (1991). Mapping the density of woody vegetative cover using Landsat MSS digital data. *International Journal of Remote Sensing*, 12: 1877-1885.